

Application No. 10/646,806
Amendment dated January 9, 2006
Reply to Office Action of October 7, 2005

Docket No.: 20140-00263-US1
YOR920000543US2

AMENDMENTS TO THE SPECIFICATION

Please amend paragraphs [0024] and [0025].

[0024] Turning now to the FIGURE, a wafer 10, coated with a layer of photoresist material 12 is shown. A photomask 11 is used to screen an image (arrows) that may be comprised of light of the desired UV frequency or of electrons. The wafer 10 supporting the exposed resist 12 is immersed in an aqueous solution of a tetraalkylammonium hydroxide 13, preferably 0.263 normal tetramethylammonium hydroxide. In the embodiment depicted, the exposed resist material is insoluble in such solutions. The FIGURE indicates that the resist image [[12]] 22 has a high aspect ratio (height/width). If exposed to high surface tension forces experienced during the drying process[[.]], the image may tend to collapse.

[0025] While still immersed, the bathing fluid 14 is changed to distilled water to rinse the wafer and then an overcoat 15 is applied. The topcoat can be applied from an aqueous based fluid or a co-solvent mixture as long as the "inert" solvent or topcoat does not distort the resist image by swelling, extraction, or collapsing the image. The stabilizers have to be soluble in the topcoat solvent as well as being able to be removed in liquefied CO₂ or supercritical fluid of CO₂ and/or inert co-solvents. Polymers or even low molecular film forming substances such as Fluorad (a trademark of 3M) such as FC-430 fluorinated surfactants can be used to overcoat the resist image. The coated resist image is temporarily stabilized prior to removal of the stabilizer by a low surface tension liquid such as CO₂. The thickness of the stabilizing coating should be as sufficient as necessary to planarize or partially planarize the resist image sufficiently to prevent image distortion. The minimum thickness of the overcoat (stabilizing film) is twice the thickness of the resist image. The thickness of said stabilizing film is from about 0.1 micron to about 5 microns. The stabilizing coatings can be cast from aqueous solutions or aqueous mixtures by spin coating or other coating techniques. The stabilizers themselves are mutually soluble in water or liquefied CO₂ or other final displacing liquid and are derived from polyethylene oxide, polyethylene oxide dimethylether, and polypropylene oxide, polypropylene oxide dimethylether, perfluoropolyether ammonium carboxylate and copolymers thereof and film forming surfactants

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as described by O'Neil et al. and Lopes et al. employing the supercritical or liquefied conditions for the CO₂ removal of the stabilizers.